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Thermal Conductivity Test Results
Richard Hardy Memorial School
South Pittsburg, Tennessee

Earth Energy Engineering, Inc. performed a thermal conductivity test at the Richard Hardy Memorial School in South Pittsburg, Tennessee on June 20, 1999. Testing was done by Bill Nagel and Freddie Allison with a Ewbank portable test unit.

The test borehole was drilled to a depth of 300 feet with 6" in diameter. At 240 feet a broken limestone formation was encountered along with an aquifer producing an estimated 100 GPM. Drilling continued to 300 feet at a slow rate due to the amount of water dampening the operation of the hammer bit. After the drill string was removed, a 1" inch loop could only be inserted to a depth of 240 feet as gravel had washed back into the hole. The borehole was backfilled with # 9 clean stone and hole plug. The formations encountered were primarily limestone. The second test hole encountered the same broken strata and water at the same elevation so drilling ceased and it is our recommendation that this depth be used in the design of the loop field.

Test temperatures did not increase after approximately 3 hours into the test. This would tend to indicate a very high thermal conductivity value or a lot of water movement in the test hole. Based on results of tests in similar formations weighed with the outcome of this test, the thermal conductivity **(k)** value can conservatively be determined at a value of **1.5 Btu/degree F-hr-foot**. This is an average conductivity per foot for the borehole. This value represents the rate at which the borehole and rock will transfer heat. All test equipment, methods, procedures, calculations and interpretations is done in accordance with the recommendations and guidelines of the International Ground Source Heat Pump Association.

Drill Log for Richard Hardy Mem. School

Hole # 1
Nearest School

53' of 6" and 21' of 5" steel casing inserted

From ft	To ft	Material	GPM
0	20	Clay	
20	48	Mud & Gravel	
48	300	Limestone 100 GPM at 238'	100

Hole # 2
Near play equipment

62' of 6" steel casing inserted

From ft	To ft	Material	GPM
0	20	Clay	
20	60	Mud & Gravel	
60	240	Limestone 100 GPM at 238'	100